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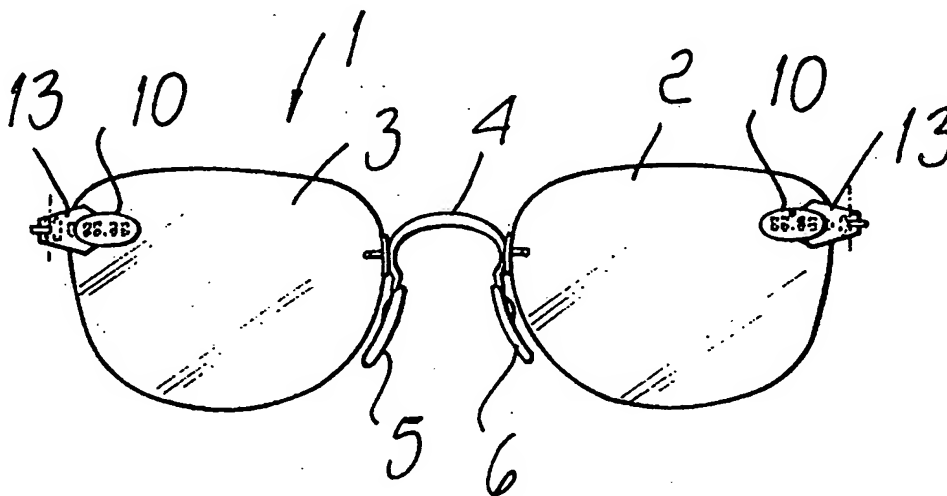
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(54) Title: EYGLASSES WITH IMPROVED FUNCTIONALITY



(57) Abstract

Eyeglasses (1) comprising two lenses (2, 3) which are connected to one another by a nosepiece (4) and with which respective temples for resting the eyeglasses on the ears are associated, wherein at least one display means (10) is arranged along the perimeter of at least one of the lenses (2, 3) of the eyeglasses, the at least one display means (10) being driven by a timepiece powered by power supply means.

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EYEGLASSES WITH IMPROVED FUNCTIONALITY

Technical Field

The present invention relates to eyeglasses with improved functionality. More particularly, the invention relates to eyeglasses which have improved
5 functionality and can offer additional functions besides providing better vision for the user.

Background Art

The possibility to know anytime and everywhere the exact time in the day is a need that is currently ever more strongly felt in today's world. This
10 need is usually met by means of conventional wristwatches which everyone now wear.

Obviously the fact of having to look at the wristwatch in order to know the exact time entails sometimes problems, especially in winter, when one wears clothing which often covers the wristwatch or in summer at the beach,
15 where the wristwatch can be a problem if it is not water-resistant. Furthermore, if the hands of the person are busy with any other operation it can be difficult to disengage them so as to be able to lift the arm and turn the wrist to read the time on the wristwatch.

On the other hand, a significant segment of the population is forced to
20 wear eyeglasses, due to sight problems, or sunglasses, and therefore eyeglasses and sunglasses are an extra accessory which people may have to carry along in addition to the wristwatch.

Eyeglasses with bifocal or progressive-addition lenses, so as to meet the ideal operating conditions intended by the user, are also commonly known.
25 The configuration of the bifocal lens is always a compromise and usually causes problems for anyone who wears eyeglasses permanently. For example, when one walks, the lower part of the lens does not allow him/her to clearly see the space ahead, and this can cause problems particularly in the presence of steps or obstacles on the ground.

30 Furthermore, when one is working for example at a computer, the lower

part of the lens hides the keyboard from view but normally only partially covers the view of the screen: this requires, especially for precision work, frequent movement of the head in order to adjust the focus.

In summary, there is an increasingly common need by users to have
5 bifocal eyeglasses in order to be able to use them both for distance and close-up viewing.

However, the use of current bifocal lenses forces the user to perform a continuous movement with the eyes, raising and lowering one's gaze, in order to focus the image in the suitable portion of the lens. This of course
10 causes discomfort and can furthermore cause physical disorders such as headaches and the like.

Disclosure of the Invention

The aim of the present invention is to provide eyeglasses which allow to combine normal sight-correction eyeglasses with a timepiece for displaying
15 the time.

Within the scope of this aim, an object of the present invention is to provide eyeglasses with an additional device which allows to display the time in a position which does not cause inconvenience to the user, since it does not interfere in the viewing field normally used during ordinary daily
20 activities.

Another object of the present invention is to provide eyeglasses whose configuration allows to temporarily vary the arrangement of the eyeglasses, raising or lowering the focal point of the lenses with respect to the ideal axis.

25 Another object of the present invention is to provide eyeglasses, of the type with and without a frame, which allow to offer additional functionalities to the user.

Another object of the present invention is to provide eyeglasses with additional functions which are highly reliable, relatively easy to
30 manufacture and at competitive costs.

This aim, these objects and others which will become apparent hereinafter are achieved by eyeglasses comprising two lenses which are connected one another by a nosepiece and with which respective temples for resting on the ears are associated, characterized in that they are provided
5 with at least one display means arranged along the perimeter of at least one of the lenses of said eyeglasses, said at least one display means being driven by a timepiece powered by power supply means.

Brief Description of the Drawings

Further characteristics and advantages of the invention will become
10 apparent from the description of preferred but not exclusive embodiments of the eyeglasses according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a front view of the eyeglasses according to a first embodiment of the present invention;

15 Figure 2 is a side view of the eyeglasses of Figure 1;

Figure 3 is a partial view of the end portion of the temples of the eyeglasses according to the invention;

Figure 4 is a partial sectional plan view of the point where the temples are coupled to the lenses in the eyeglasses according to the present
20 invention;

Figure 5 is a view of a second embodiment of the eyeglasses according to the present invention;

Figure 6 is a front view of a third embodiment of the eyeglasses according to the invention;

25 Figure 7 is a front view of a first and second position for using the eyeglasses according to the invention;

Figure 8 is a front view of a fourth embodiment of the eyeglasses according to the present invention;

Figure 9 is a top plan view of a fifth embodiment of the eyeglasses
30 according to the present invention;

Figure 10 is a top plan view of a sixth embodiment of the eyeglasses according to the present invention;

Figure 11 is a top plan view of the eyeglasses according to the present invention.

5 Ways of carrying out the Invention

With reference to the above figures, in which identical reference numerals designate identical elements, and initially to Figures 1 to 4, the eyeglasses according to a first embodiment of the invention, generally designated by the reference numeral 1, comprises, in a rimless version,
10 lenses 2 and 3 which are connected one another by means of a nosepiece 4 to the lower region whereof two nose-pads 5 and 6 are connected. Two temples 8 and 9 are respectively provided and are connected to the lenses 2 and 3 in order to be able to wear the eyeglasses normally.

The particularity of the invention resides in that it comprises display
15 means 10 which are arranged at the upper rim of at least one of the lenses 2 and 3.

Conveniently, the display means 10 are suitable to display the signal that originates from a timepiece 11 which is accommodated in one of the temples 8.

20 Conveniently, the display means 10, in the case of rimless eyeglasses, as shown in Figures 1, 2 and 3, are arranged on the outer surface (or on the inner surface) of one of the lenses 2 and 3 at the upper rim of the lens, proximate to the point where the temple 8 and 9 is hinged to said lens.

In particular, the display means 10 are constituted by a thin liquid-crystal
25 screen which is glued or otherwise applied to the lens 2 and 3, and on the opposite side of the lens there is a corrective lens 12 which is designed to allow the wearer of the eyeglasses to correctly view the display means 10.

The connection between the temples 8 and 9 and the lenses 2 and 3 occurs by means of a hinge 13 which connects the temple 8 and 9 to the lens
30 2 and 3.

The timepiece 11 is conveniently powered by a battery 15 which is accommodated at the end portion of the temple 8 and 9, and there are also buttons for setting the time and an optional alarm, designated by the reference numerals 16 and 17 respectively.

5 Said buttons are accommodated at the end portion of the temple 8 and 9 and can be actuated by the user, using a sharp tool (such as a ball-point pen).

The hinge 13 is conveniently made of metallic material and the temple 8 and 9 constitutes the positive contact for the operation of the timepiece 11, whereas elastic contact means 18, which constitute the negative contact, are associated with the temple 8 and 9 at one end, and their opposite end is curved and makes contact with a metal plate 20 which allows the closure of the electric contact between the elastic contact means 18 and the hinge 13.

15 A layer 21 of insulating material is provided between the hinge 13 and the plate 20 in order to avoid a short-circuit.

Figure 4 illustrates the temple 8 in the two positions: the operating position, in which the eyeglasses are worn by a user and therefore electrical contact between the temple 8 and the contact means 18 made of metallic material is achieved, in order to supply power to the display means 10 driven by the timepiece 11, and a position, shown in dashed lines, in which the temples 8 and 9 are folded and the eyeglasses are not in use.

In this condition, the electrical contact for supplying the display means 10 is therefore interrupted, allowing to preserve the battery 15.

25 An additional layer of insulating material 23 is provided between the temple 8 and 9 and the contact means 18, which are advantageously provided by a contact spring.

Advantageously, it is possible to provide two display means 10 arranged at upper rims of the respective lenses 2 and 3; one of said means is connected to a respective timepiece 11 with an associated battery 15 and can
30 act as display for a timer.

In this manner, the user can have, at one eye, display means 10 which are suitable to display the time signal and, at the other eye, display means 10 suitable to display a timer, which is useful for warning the user for example of an engagement, an appointment or the like. The flashing of the display
5 means 10 assigned to the timer function in fact allows to warn the user at a presettable time.

Conveniently, the concavity of the corrective lens 12 is directed toward the outside of the lens, i.e., toward the display means 10, so as to allow the user optimum viewing of said display means even if said viewing occurs at
10 extremely close range.

Therefore, the eyeglasses according to the invention have at least one display means and at least one quartz timepiece and an associated battery accommodated in one of the temples 8 and 9 at the lens on which said display means 10 are provided.

15 In a second embodiment, shown in Figure 5, the display means 10 are directly integrated in the frame 25 of the eyeglasses, if said frame is provided, and the supply of power to said display means 10 is ensured by two wires 26 and 27 embedded in said frame 25.

Conveniently, the contact means 18, constituted by a contact spring, run
20 along the entire length of the temple 8 and 9 in order to connect to the battery 15.

With reference now to Figure 9, the eyeglasses according to the present invention comprise, in a further embodiment generally designated by the reference numeral 1, two lenses 2 and 3 which are connected one another by
25 a bridge or nosepiece 4 with which supports 5 and 6 for resting the eyeglasses on the nose of a user and two temples 8 and 9, respectively connected to the lenses 2 and 3 by means of a frame 13, are conventionally associated.

A timepiece 11 is associated with the frame 13 and at least one display
30 means 10 is rigidly coupled to the timepiece 11, is arranged substantially

proximate to a corner of one of the two lenses 2 and 3 so as to not interfere with the vision of the user through the lenses, and is spaced from said lenses.

5 Reflective means 12, suitable to reflect the image that is present on the display means 10 with the optical correction required by the very short distance, are provided; in the embodiment of the invention, shown in Figure 9, said reflective means are applied for example to the lens 2 and 3 at which the display means 10 are provided.

10 In this case, the display means 10 and the reflective means 12 with optical correction, are arranged so as to be axially offset, so that the eye of the user can, by looking into the mirror 12, see reflected therein the time signal displayed by the display means 10.

The reflective means 12 can be fixed and built into the lens 2 and 3, for example in the case of sunglasses, whereas for sight-correction eyeglasses 15 said reflective means can be fixed to other parts of the eyeglasses so that it is possible to change the lens for the required sight correction.

The embodiment of Figure 9 therefore allows the user to have a clear viewing field, since the display means 10 and the reflective means 12 do not interfere with the normal vision that the user wishes to have through the 20 lenses 2 and 3 of the eyeglasses.

In still a further embodiment of the eyeglasses according to the invention, shown in Figure 10, the display means 10 are arranged on the portion of the frame, near to temple 8 and 9, that is located laterally to the lens 2 and 3, i.e., on the front portion of the frame 13, but outside with 25 respect to the lens 2 and 3. The reflective means 12 are instead conveniently associated with an auxiliary temple 45 which, being associated with the temple 8 and 9, is suitable to move from a position in which it is fully retracted, and in which therefore the reflective means 12 are in contact with the display means 10, to an extended position, in which the reflective means 30 12 are spaced from the display means 10 and the eye of the user, again

designated by the reference numeral 40, can direct its gaze onto the reflective means 12, which reflect the image (time signal, for example) displayed on the display means 10.

In this embodiment of the invention, the presence of the timepiece and of the associated display means is covered and concealed by the presence of the additional temple 45, which in the retracted position covers, with its front portion, the portion of the eyeglasses in which the timepiece 11 and the display means 10 are provided.

The principle of the mutual arrangement of the display means 10 and of the reflective means 12 is the one shown in Figure 11 for this embodiment as well.

Finally, with reference to Figure 11, a further embodiment of the eyeglasses according to the invention is illustrated, in which the timepiece 11 is arranged centrally with respect to the lenses 2 and 3 and is associated for example with the nosepiece 4; in this case it is possible to provide two display means 10, each arranged at the respective corner of the lens 2 and 3, adjacent to the timepiece 11, with a corresponding reflective means 12 arranged as shown in Figure 4.

In this last embodiment, the display means 10 can alternatively display the time signal, the date and/or an alarm signal or for example a temperature or altitude indication and the like. In case the subsidiary display is not needed, its place can be occupied by parts of the timepiece 11, such as the battery, to preserve the symmetry.

In practice it has been observed that the eyeglasses according to the invention fully achieve the intended aim, since they allow to combine with ordinary eyeglasses a timepiece and/or a timer, suitable to allow the user to always know the exact time.

The timepiece and/or timer can be viewed exclusively by the person wearing the eyeglasses.

Moreover, the possibility to change the distance between the nose-pads

of the eyeglasses allows to lower or raise the points for resting on the nose and therefore the center of the lenses with respect to the eye, accordingly allowing to temporarily vary their focal point.

In this manner, the need for the user to manually raise and lower the eyeglasses on the nose is eliminated.

The eyeglasses thus conceived are susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with other technically equivalent elements.

Figures 6 and 7 illustrate another embodiment of the eyeglasses according to the invention, in which the nosepiece 4 is made of a flexible material and is shaped appropriately so as to form a plurality of seats 28, 29 and 30, for example for engaging compression means 31 which are conveniently formed for example by the bridge 31.

In Figures 6 and 7, the nosepiece 4 is fixed and the bridge 31 is movable.

In Figure 8, instead, the nosepiece 4 is movable and the bridge 31 is fixed.

The function of the bridge 31, when it is engaged in the seats 28, 29 and 30, is to allow to fix, at the various positions, the geometry of the nosepiece 4 so as to allow to place the eyeglasses at different heights on the nose.

In practice, with bifocal or progressive-addition eyeglasses the device allows to temporarily vary the focal point with respect to the basic configuration, so as to meet in the best possible way the sight requirements of the user in the two operating conditions, i.e., distance vision and close-up vision.

By varying the mutual positions of the nosepiece 4 and of the bridge 31, the distance between the nose-pads 5 and 6 in fact changes, lowering or raising the points for resting on the nose and accordingly the center of the lenses 2 and 3 with respect to the eye.

Figure 7 illustrates, in the left portion, the bridge 31 arranged in the

lowest seat 30, at which the bridge 31 allows the nosepiece 4 to widen so that the eyeglasses are arranged in the lowest part of the nose.

The right portion of Figure 7 instead illustrates the condition in which the movable bridge 31 is accommodated in the first seat 28 and in this
5 situation the nosepiece 4 is compressed into the upper portion, causing the mutual approach of the nose-pads 5 and 6, which rest on the upper part of the nose. This is the position suitable for close-up vision, such as for example when reading or when using a computer.

The structure of the nosepiece 4 (whether fixed or movable) must be
10 flexible enough to allow the bridge 31 (whether fixed or movable) to change its geometry, so as to move the nose-pads 5 and 6 closer or further apart.

In practice, the materials used, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

15 The disclosures in Italian Patent Applications No. MI99A000132 and No. MI99A001630 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. Eyeglasses comprising two lenses which are connected one another by a nosepiece and with which respective temples for resting the eyeglasses on the ears are associated, characterized in that they are provided with at least one display means arranged along the perimeter of at least one of the lenses of said eyeglasses, said at least one display means being driven by a timepiece powered by power supply means.

2. The eyeglasses according to claim 1, characterized in that said at least one display means is applied to the outer surface of at least one of said lenses.

3. The eyeglasses according to claim 1, characterized in that said at least one display means is applied to the internal surface of at least one of said lenses.

4. The eyeglasses according to claim 2, characterized in that they have a corrective lens which is arranged on the internal surface of said at least one lens on the outer surface of which said display means is applied.

5. The eyeglasses according to one or more of the preceding claims, characterized in that they have, for each one of said temples, a hinge which is suitable to connect the temple to the corresponding lens, said hinge being made of metallic material.

6. The eyeglasses according to one or more of the preceding claims, characterized in that said temple is connected to the positive terminal of said power supply means of said timepiece, contact means being connected to the negative terminal of said power supply means and being arranged parallel to said temple.

7. The eyeglasses according to one or more of the preceding claims, characterized in that said contact means comprise a contact spring which, in the open position of said temple, is suitable to make contact with a metallic element which is connected to said hinge by means of a layer of insulating material.

8. The eyeglasses according to one or more of the preceding claims, characterized in that said hinge and said metallic element make contact with said display means in order to supply power thereto.

9. The eyeglasses according to one or more of the preceding claims,
5 characterized in that they are provided with an element made of insulating material which is arranged between said temple and said contact means.

10. The eyeglasses according to one or more of the preceding claims, characterized in that they are provided with buttons for setting said timepiece, said buttons being arranged at the end portion of said temple,
10 said timepiece being arranged within one of said temples.

11. The eyeglasses according to one or more of the preceding claims, characterized in that they are provided with two display means which are arranged at the rims of said lenses, one of said display means being adapted to display the time signal, the other one of said display means being adapted
15 to display a timer and to provide, by flashing, a visual alarm to the user.

12. The eyeglasses according to claim 1, characterized in that said at least one display means is embedded in the frame of said eyeglasses.

13. The eyeglasses according to claim 1, characterized in that they comprise a frame which defines a seat for accommodating said at least one
20 display means.

14. The eyeglasses according to one or more of the preceding claims, characterized in that said nosepiece is made of flexible material and is shaped so as to define a plurality of engagement seats for a bridge which is suitable to allow to vary the distance between the nose-pads which are
25 associated with said nosepiece and are designed to allow said eyeglasses to rest on the nose of the user.

15. The eyeglasses according to claim 14, characterized in that said bridge is parallel to said nosepiece at one of said plurality of seats.

16. The eyeglasses according to one or more of the preceding claims,
30 characterized in that said bridge can move from one of said plurality of seats

to the other seat in order to vary the distance between said nose-pads and accordingly vary the position of said nosepiece on the nose of the user.

17. The eyeglasses according to claim 1, characterized in that said at least one display means being driven by a timepiece, is arranged at a rim of one of said lenses and is separate from it.

18. The eyeglasses according to claim 17, characterized in that said timepiece is associated with the frame, said at least one display means being rigidly coupled to said timepiece and being arranged at the internal surface of one of said lenses.

19. The eyeglasses according to claim 18, characterized in that they comprise reflective means with optical correction arranged in front of said at least one display means, to make it visible from a very short distance.

20. The eyeglasses according to claims 17-19, characterized in that said reflective means comprise a mirror which is axially offset with respect to said at least one display means.

21. The eyeglasses according to claim 17, characterized in that said at least one display means is associated with a front portion of said eyeglasses, adjacent to one of said lenses.

22. The eyeglasses according to claim 21, characterized in that they comprise an auxiliary temple which is associated with one of said temples and supports at least one reflective means, said auxiliary temple being adapted to pass from a retracted position, in which said at least one reflective means is in contact with said at least one display means, to a position in which said auxiliary temple protrudes with respect to said temple with which it is associated, so that said at least one reflective means is arranged so as to face and be spaced from said at least one display means.

23. The eyeglasses according to claim 17, characterized in that said timepiece is associated with said nosepiece.

24. The eyeglasses according to claim 23, characterized in that they comprise two display means which are connected to said nosepiece, in a

symmetrical position with respect to said timepiece, for the simultaneous viewing of said display means by the user.

25. The eyeglasses according to claim 24, characterized in that each one of said display means connected to said nosepiece is provided, at the front,
5 with a respective reflective means which is also connected to said nosepiece, said display means being constituted by a liquid crystal display or similar.

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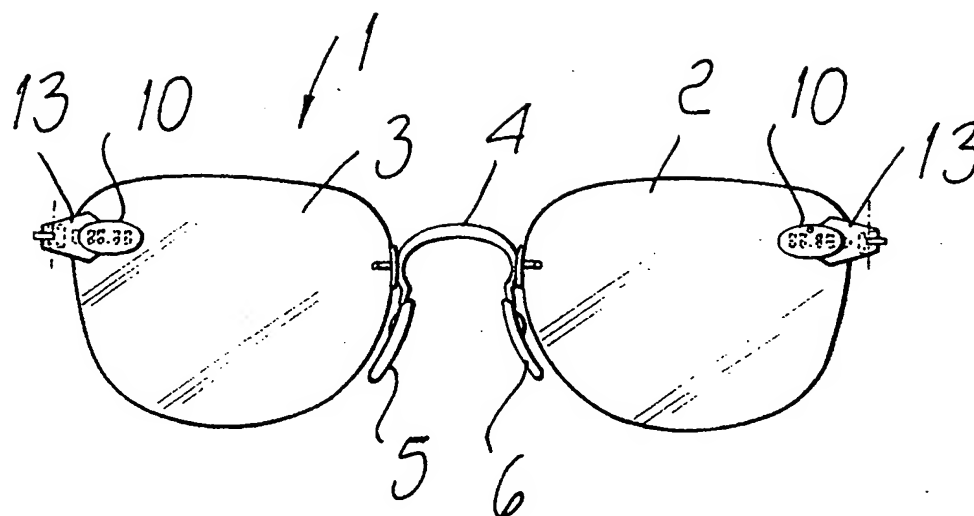


Fig. 1

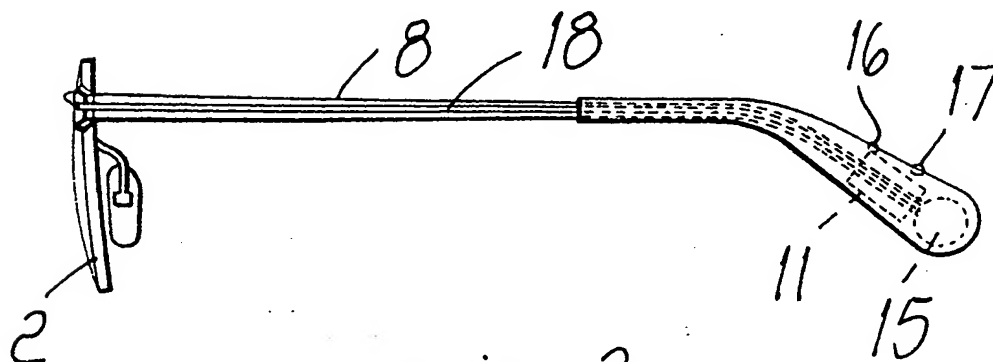


Fig. 2

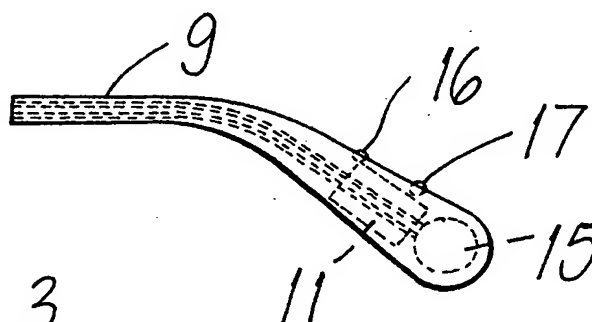


Fig. 3

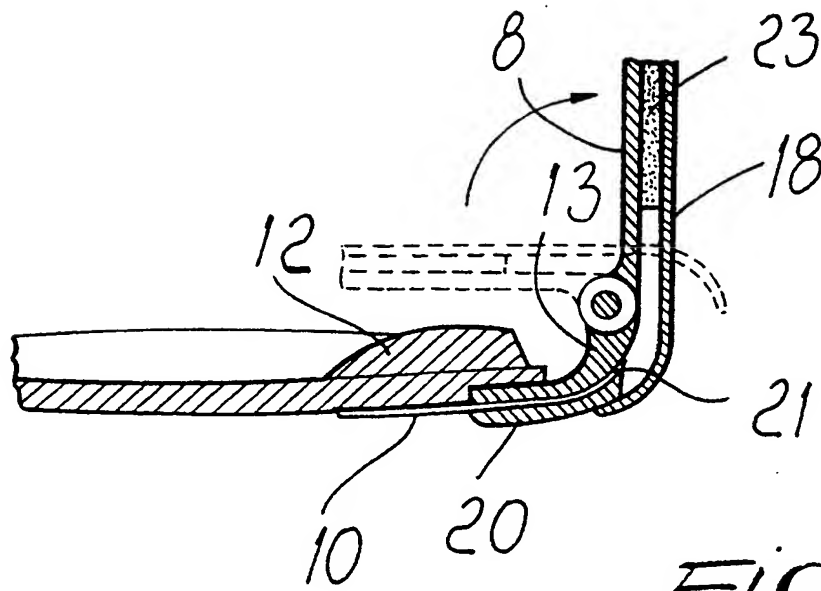


Fig. 4

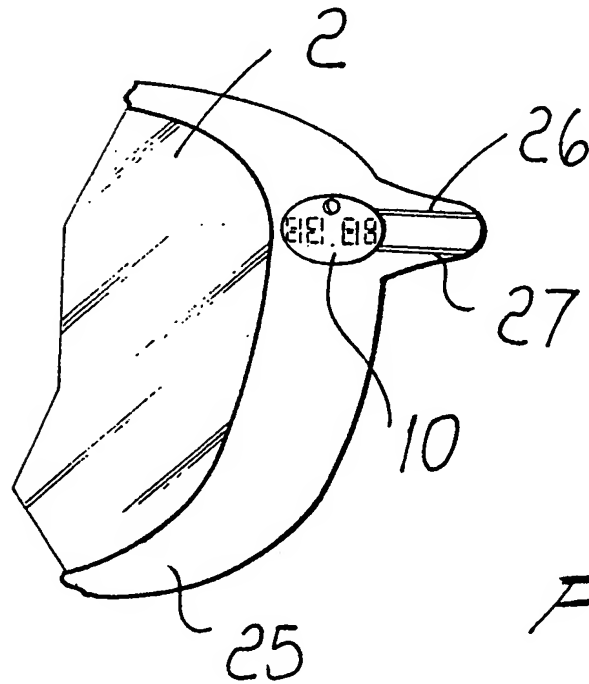


Fig. 5

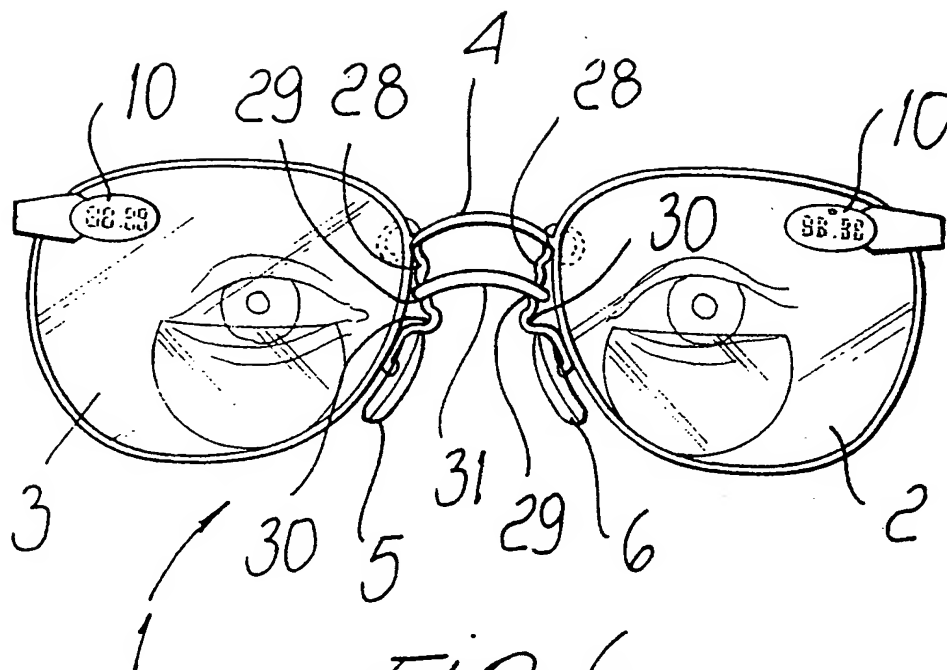


Fig. 6

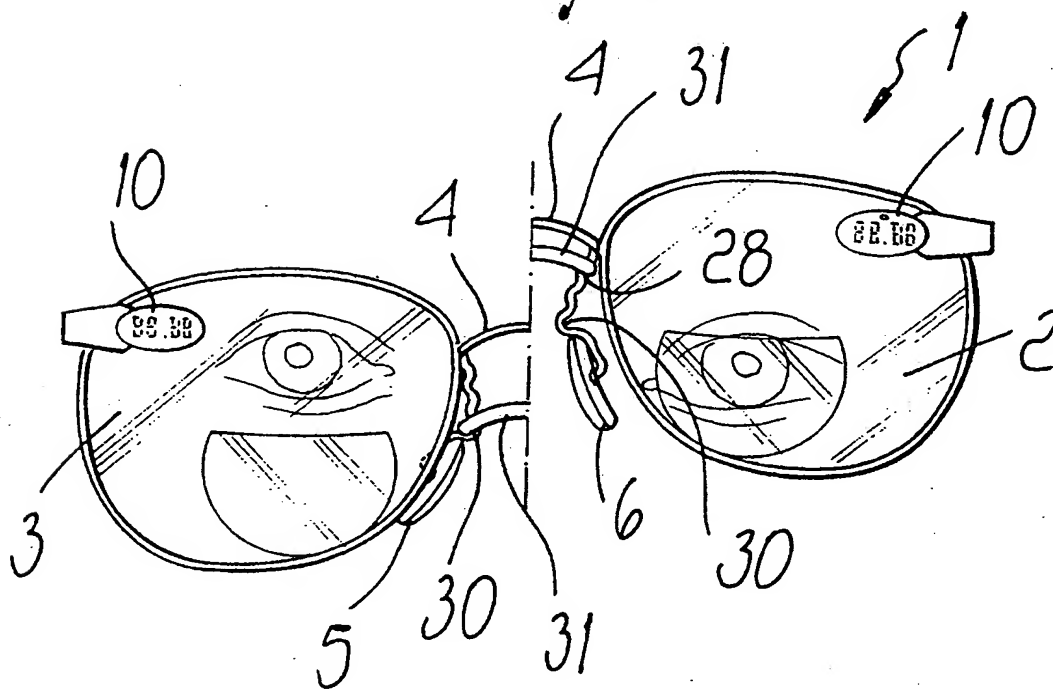


Fig. 7

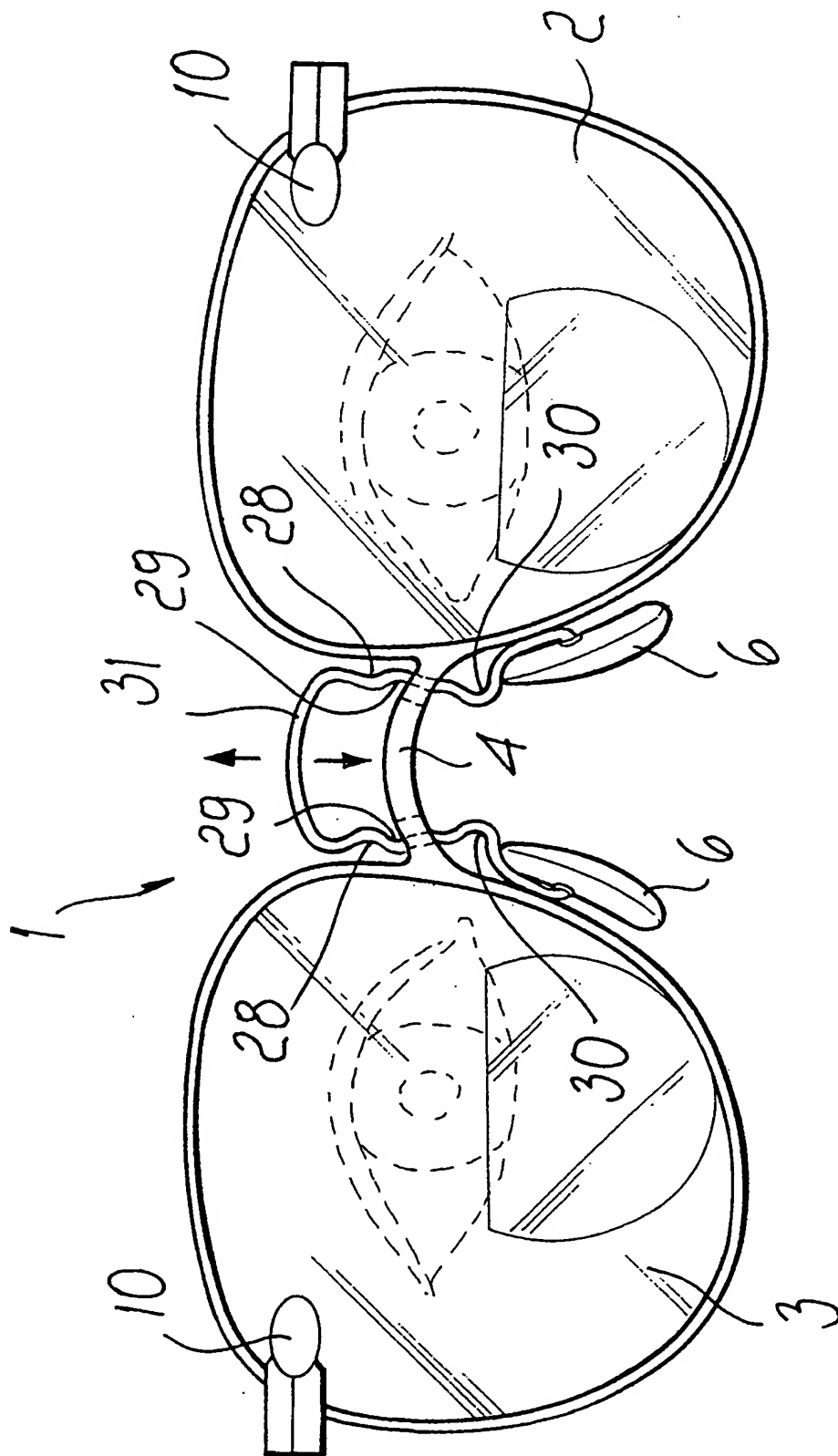


Fig. 8

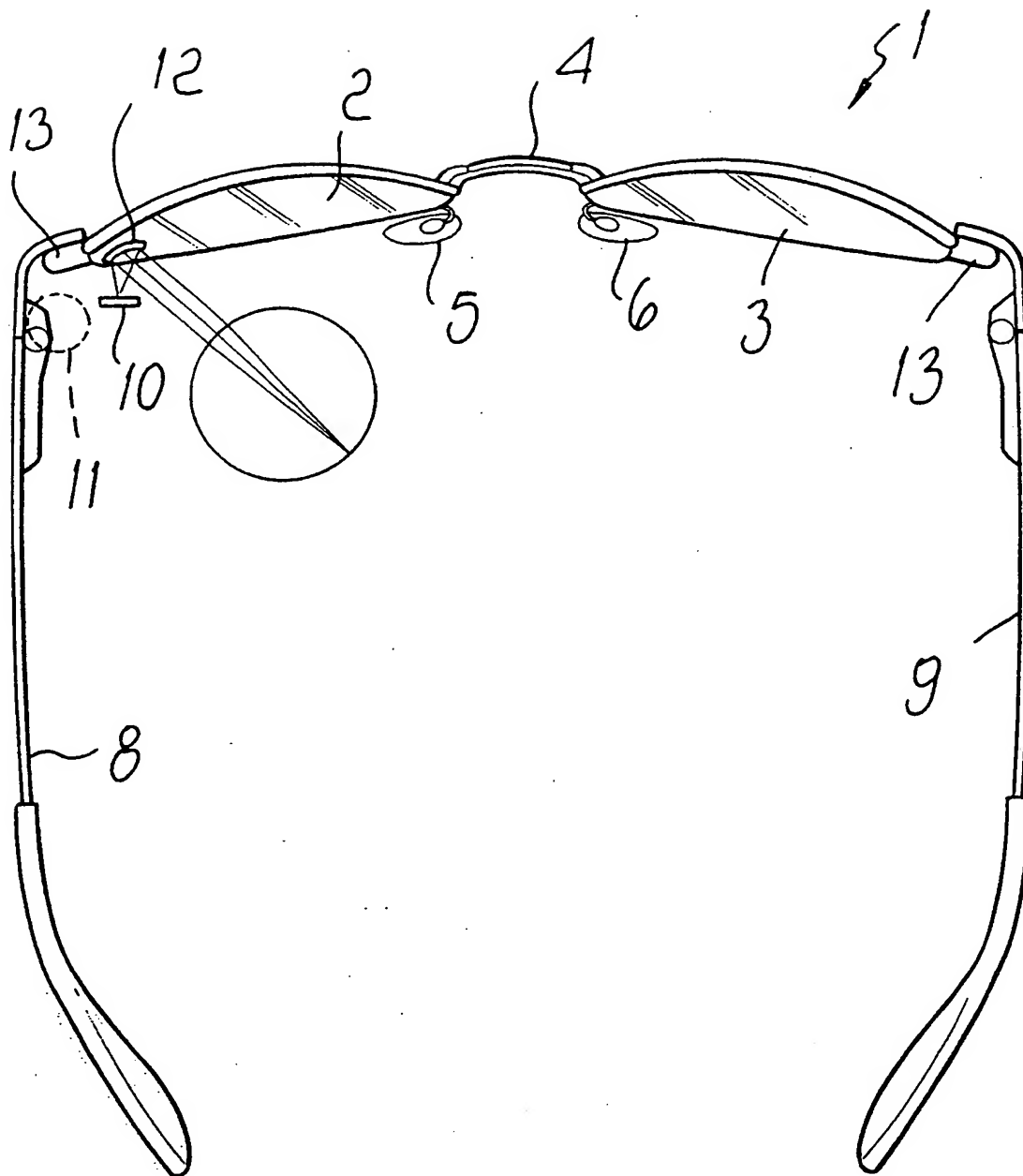


Fig. 9

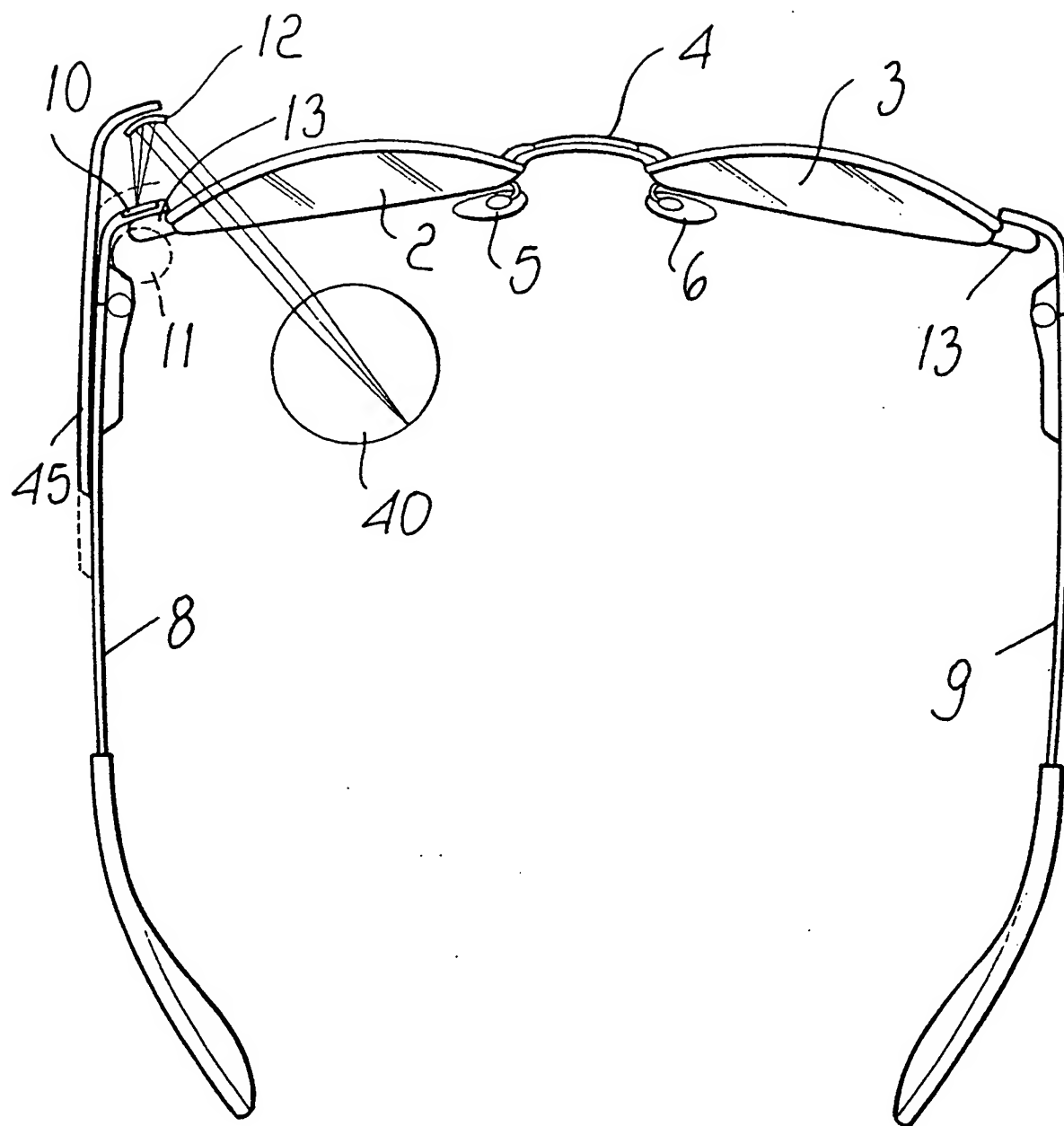


Fig. 10

FIG. 11

INTERNATIONAL SEARCH REPORT

Intern. Application No.
PCT/EP 00/00509

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G02C11/00				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) IPC 7 G02C				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	DE 196 25 435 A (SCHLUETER KLAUS DR ING) 2 January 1998 (1998-01-02) column 1, line 40 -column 4, line 7	1-4, 10, 17-20		
X	US 4 796 987 A (LINDEN HARRY A) 10 January 1989 (1989-01-10) column 1, line 51 -column 3, line 17	1, 2, 4, 10, 17, 18		
A	US 5 455 640 A (GERTSIKOV DANIEL G) 3 October 1995 (1995-10-03) column 5, line 21 - line 43	1, 11-13		
A	WO 94 09398 A (ROBINSON ALEC) 28 April 1994 (1994-04-28) page 2, line 31 -page 3, line 11	1, 11, 12		
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<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; border: none;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; vertical-align: top; border: none;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
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Date of the actual completion of the international search <div style="text-align: center; font-weight: bold;">8 May 2000</div>	Date of mailing of the international search report <div style="text-align: center; font-weight: bold;">15/05/2000</div>			
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3018	Authorized officer <div style="text-align: center; font-weight: bold;">CALLEWAERT, H</div>			

INTERNATIONAL SEARCH REPORT

Interr. Application No.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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